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GERONTOLOGY INSTITUTE

The Physician's Role in the Cost of Prescription Drugs

UNIVERSITY OF MASSACHUSETTS AT BOSTON

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The Physician's Role
in the Cost of
Prescription Drugs

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EXECUTIVE SUMMARY

BACKGROUND

Prescription drug expenditures are one of the highest out-of-pocket health care expenses for the nation's elderly. Although elders represent only 12% of the U.S. population, they use approximately 30% of the prescription drugs sold. Prices for prescription drugs increased by 88% from 1981 to 1988, even though the increase in the Consumer Price Index for the same period was only 28%. Since the physician is the key decisionmaker in drug utilization choices, the Gerontology Institute at the University of Massachusetts at Boston undertook a study in April 1990 to ascertain physician awareness of the cost of prescription drugs for elders.

METHODOLOGY

The study was designed to respond to two major research questions:

1. What is the level of physician knowledge of the costs of prescription drugs?
2. To what extent do physicians consider the prices of the drugs they prescribe?

Questionnaires for two surveys were developed: one for pharmacies and the other for physicians.

The pharmacy survey sought to determine the prices of 14 prescription drugs commonly used by elders. This information was used as baseline data by which to measure physician knowledge of drug costs. Twenty-two pharmacies in the greater Boston area formed the convenience sample for the pharmacy survey.

The physician survey was developed to gauge physician knowledge of the cost of the 14 selected drugs as well as to ascertain whether concern regarding the price of drugs affected the prescribing process. A sample of 132 Massachusetts physicians were asked to fill out a questionnaire.

MAJOR FINDINGS

1. Physicians had a low level of knowledge of drug costs.
    - Only 14% had a score of 50% or more correct estimates.

-- Physicians overestimated the prices of the less expensive drugs and underestimated the costs of the more expensive drugs.

-- Younger doctors were more likely than older doctors to correctly estimate the price of drugs

-- Physicians had limited knowledge of differences in prices between brand-name drugs and their generic equivalents.

2. Many physicians do not receive information about drug costs; 30% of respondents indicated they "rarely" or "never" receive drug cost information.
3. Drug company salespeople ("detail men") were the most commonly cited source of information on drug costs; 37% of respondents indicated this as their chief source of information about drug prices.
4. Many physicians still remain skeptical about generic drugs and do not discuss generic alternatives with their patients.
5. Physicians indicated that they consider the cost of a drug and a patient's ability to pay when prescribing.

-- Eighty percent said there were situations in which it was appropriate to let a patient's ability to afford a drug influence the drug selection.

-- Sixty-nine percent said knowing whether a patient's drug costs were covered by third-party payers affects the drugs they prescribe.

6. Physicians say they respond to a patient's inability to pay for a drug by switching to a cheaper alternative. In response to two separate questions, 73% and 84% of respondents indicated that they would prescribe a less expensive drug if a patient indicated the inability to purchase the first one prescribed.
7. Physicians indicate there is some interest in price and some concern about the ability to afford drugs among patients.

-- Sixty-four percent of physicians said patients frequently or sometimes ask about the cost of a drug.

-- Eighty-five percent of physicians said they have some patients who express the fact that they cannot afford prescribed drugs.

CONCLUSION

This study shows a widespread ignorance concerning the cost of drugs on the part of physicians and yet a high level of agreement among physicians that the affordability of a drug should be considered in the prescribing process. The findings imply that education of physicians may be a method that could reduce expenditures on prescription drugs.

Physicians certainly can not be expected to research drugs and drug prices on their own. Universities, physicians' professional associations, hospitals, and insurance companies need to address the best methods for providing valuable and updated information on drugs and drug cost to physicians. One innovative approach to the re-education of physicians on drug costs is called "academic detailing" and involves visits to physicians by clinical pharmacists who work as education outreach workers regarding cost and efficacy of commonly used drugs. This program should be studied for possible replication. Other possible options for providing information to physicians on drug costs, include periodic distribution by either hospitals or consumer health groups of lists of commonly used drugs and their costs. Drug cost information could also be included in medical journal articles on drugs and in medical advertising for drugs. As drug costs become a source of increasing concern, efforts to control costs should focus more attention on those who are prescribing them.

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INTRODUCTION

Prescription drugs are a central component of the medical care of the elderly and provide an important benefit to the health of older persons. Drugs, however, are one of the highest out-of-pocket health care expenses for the nation's elderly.[1] The Gerontology Institute of the University of Massachusetts at Boston undertook a study in April, 1990 to ascertain physician awareness of the cost of prescription drugs for elders. The physician is the key decisionmaker in drug utilization choices. The study sought to determine whether physicians were aware of actual drug prices and to understand how and whether drug cost was considered by physicians when prescribing to patients. The premise of the study was that prescription drug expenditures could be reduced by providing information to physicians on cost-effective prescribing and by influencing their prescribing practices.

BACKGROUND

Impact of High Cost of Prescription Drugs on Elders

The cost of prescription drugs is rapidly becoming a major problem for older Americans. Although elders represent only 12% of the U.S. population, they use approximately 30% of the prescription drugs sold.[2] This high consumption rate is largely a result of chronic medical conditions requiring long-term medications. Approximately 80% of those over 65 have one or more chronic illnesses and drug therapy is an essential part of their health maintenance.[3]

At present, drug costs represent a growing burden for many elders. Prices for prescription drugs have increased by 88% from 1981 to 1988 even though the increase in the Consumer Price Index for the same period was only 28%.[4] Also, most drug costs are still not covered by third-party payers. The recently repealed Medicare Catastrophic Coverage Act of 1988 would have provided a comprehensive Medicare drug benefit and brought significant relief to approximately 16% of elders struggling with these costs. While Medicaid does provide some coverage for prescription drugs, many states are currently evaluating this program because of its escalating costs and are looking for areas of cost savings within it.

Testimony on the negative impact of the high cost of these drugs was provided by many older persons testifying before the U.S. Senate Special Committee on Aging in 1989.[5] Several people discussed their inability to afford the very drugs that they needed to stay alive and of confronting impossible decisions on whether to use limited funds for housing or for health needs. A 1989 study by the American Association of Retired Persons (AARP) on the impact of prescription drug costs on New Hampshire's older citizens disclosed equally troubling findings. Over 14% of the 1,875 elders surveyed had not filled a specific prescription in the previous year because of the cost of the medication, and almost 12% cut back on the amount of medication prescribed by a doctor because of its cost. In addition, over 35% of the sample indicated that they had trouble paying for necessities such as food, rent, or other medical needs because of the cost of prescription drugs.[6]

The availability of insurance payments for prescription drugs for the low-income elderly population is an important element in determining access to drug therapy for that population. A study of New Hampshire's Medicaid recipients showed a direct relationship between Medicaid coverage and elders' prescription drug use. When New Hampshire implemented a three-drug payment limit in 1981, use of both ineffective and essential drugs by the affected population dropped significantly.[7]

The Four Major Players In The Delivery of Drug Therapy

Prescription drug expenditures can be analyzed more closely by reviewing the differing roles of the four major players involved in drug therapy delivery: the manufacturer, the physician, the community pharmacist, and the consumer.[8]

The Manufacturer

Many have charged that manufacturers engage in practices that inflate drug prices but do not actually enhance drug therapy. In 1989, the U.S. Senate Special Committee on Aging charged that "Prescription drug manufacturers have opted to expand their market by charging penthouse prices to compensate for the poverty of their innovation over the past decade... Eighty-four per cent of the 348 new drugs brought to market by the 25 largest U.S. drug manufacturers between 1981 and 1988 were evaluated by the federal Food and Drug Administration (FDA) as having 'little or no' potential for therapeutic gain over existing drug therapies." [9]

Drug companies usually point to the high costs of research and development as the reason for rising drug prices. Yet much of the manufacturer's research and development efforts are aimed at producing drugs that duplicate currently available and less costly drugs. The resulting research, development, and advertising costs are ultimately passed on to the consumer in the form of higher prices for the "me too" drug. For example, the staff of the U.S. Senate Committee on Aging reviewed manufacturer prices for four anti-ulcer drugs that were developed in the 1980s. The innovator product was cimetidine (Tagamet), produced by Smith Kline & French Corp. The other three drugs that were introduced during this period were rated by the FDA as "having little or no therapeutic gain" over Tagamet. Yet each succeeding drug was priced higher than Tagamet. The first of the three "me too" anti-ulcer drugs was Zantac, marketed by Glaxo Holdings, Inc. in 1983 and priced 46% higher in cost per day of therapy than Tagamet; it now has more than half the market for this drug class. The next two "me too" drugs were also priced higher than Tagamet, and the price of Tagamet also increased significantly with the introduction of each of the other three anti-ulcer drugs.[10] In some cases, companies have responded to price concerns by negotiating discount and lower prices for volume buyers such as the Veterans Administration and some hospitals and nursing homes. For the most part, however, the market for prescription drugs has not been price-competitive.[11]

The Physician

The purchase of drugs differs from the purchase of most other consumer goods in that the purchasing decision is made by a party other than the actual consumer. The public assumption has generally been that physicians make these determinations for their patients based on many years of pharmacological training and on current scientific and medical research. Much recent criticism has focused on the scanty preparation in applied pharmacology given medical school students.[12] This problem is particularly serious in relation to pharmacotherapy for the elderly.[13] As a result, many physicians often depend for information on commercial as opposed to scientific sources of information.[14] One study of behavior found that advertising by drug companies and visits by "detail men" or salespeople representing drug companies were the predominant factors in shaping this behavior.[15] This reliance on detail men is disturbing, particularly since in 1988 less than 5% of these people had formal training in pharmacology or pharmacy.[16]

Not only do drug companies provide drug information to physicians, but they also influence their selection of drugs by giving them expensive gifts and incentives. When physicians are still in medical school, they may be offered free equipment, books, or vacations. As they enter practice, the gifts continue and can include free drug samples and bonuses based on how much of a specific company's drug is prescribed by the physician. In 1988 drug companies spent more than $5,000 per U.S. physician or $2.5 billion in an effort to promote their products, much of which was eventually passed on to consumers through higher drug costs.[17]

One way in which physicians can influence their elderly patients' drug expenditures is through the prescription of generic instead of brand-name drugs. Generic drugs refer to those drugs that have been judged by the FDA to be interchangeable with more expensive brand-name drugs. A 1985 Massachusetts law promotes the dispensing of generic drugs by requiring that pharmacists dispense the generic drug unless the physician has specifically indicated a preference for the brand-name by writing "no substitution" on the prescription form.[18] However, while this law facilitates the prescription of generic drugs, a significant amount of resistance by physicians to the prescribing of generic drugs still remains. Part of this resistance is based on concern for the therapeutic effectiveness and bioequivalence of some generic drugs. However, studies have shown that even when physicians have no strong medical rationale for prescribing the brand-name, they often prescribe it out of habit or brand loyalty.[19]

The Community Pharmacist

The choice of pharmacy can also make a significant difference in the cost of prescription drugs. A 1989 American Association of Retired Persons (AARP) study found great variation in the average price of prescription drugs at pharmacies within the same community. The study also revealed that while consumers could achieve substantial savings by purchasing generic drugs, at some pharmacies prices for generics were as high as prices for brand-names at other pharmacies.[20]

The status of community pharmacies is undergoing significant change. In Massachusetts there are about 1,200 pharmacies, half chain and half independently owned. Many of the independents are finding it increasingly difficult to compete, particularly given the expanded use of mail-order prescription drug programs by third-party payers.

For many elders, the chief source of information on the drugs they use is the community pharmacist. Older people are often more comfortable discussing specifics about the use of their medications as well as cost with their pharmacists rather than their physicians. Some pharmacists fulfill a valuable counseling role for their elderly patients, but this practice is not widespread. Instead, "over 70% of all patients report receiving no information from pharmacists and for elderly patients the incidence is even higher."[21] Many pharmacists do not provide information and guidance that would help the consumer, including putting enough information on labels, providing private places in which elders can discuss their personal situations, and keeping adequate patient profiles on drug use.[22]

The Consumer

The elderly consumer can have some impact on the cost of prescription drugs by initiating discussions on the subject with physicians in order to fully understand their options. They can call several pharmacies and investigate mail-order pharmacy companies to achieve the best possible savings. While comparison shopping can help save money, this solution can also be problematic. Since many elders take more than one drug, it is vital that all drugs be checked for possible interactions with one another. The danger with comparison shopping is that no one pharmacy will have a record of all the drugs an elderly consumer is taking in order to test for such interactions. Further, comparison shopping can be difficult because of problems with finding transportation and physical access to several pharmacies. Elderly consumers can also advocate as a group to reduce drug costs and to expand third-party coverage of drug costs.

One recent change in the pharmaceutical industry has been the trend to advertise prescription drugs directly to the consumer through print media and television. Though subject to government regulation, these advertisements are controversial and can potentially have both positive and negative consequences for the consumer. They may cause consumers to become more attentive to and involved in the issues of drug selection and drug cost and motivate them to ask more questions of physicians and pharmacists. On the other hand, direct advertising may confuse or mislead many consumers. For example, they may assume a drug is appropriate for their medical condition when it is not. In addition, the cost of advertising to consumers will almost certainly be passed on through higher drug prices. But in either case, consumers are likely to have a say about the costs of prescription drugs as a more educated, vocal, and organized generation of elders emerges and as drug costs become an increasing financial burden.

METHODOLOGY

Physicians' knowledge of prescription drug prices and their sensitivity to the costs of such drugs are key issues in the effort to control prescription drug expenditures. While all four players in the delivery of drug therapy have roles to play in helping control the costs, the physician directly affects the purchasing decision. By prescribing effective yet less costly drugs, the physician can reduce the out-of-pocket drug costs for elders and influence drug manufacturers by increasing the volume of sales of lower-priced drugs. Short of federal controls on drug prices, the changing of the behavior of physicians in prescribing drugs may be the most effective and most feasible way to help reduce the burden of the high cost of prescription drugs. As the main target of manufacturers' marketing and the persons most in control of purchasing decisions, physicians can impact the market. They also can assist elders in making cost-effective decisions about drug choices.

The Gerontology Institute's study on the relationship of physicians' prescriptions to drug costs was designed to respond to two major research questions:

1. What is the level of physician knowledge of costs the of prescription drugs?
2. To what extent do physicians consider the prices of the drugs they prescribe?

Two survey questionnaires were developed by students of health care policy in the Gerontology Program at the University of Massachusetts at Boston: a pharmacy survey and a physician survey. The majority of the students participating were themselves retired, and many had personal experiences with the high cost of prescription drugs.

Pharmacy Survey

The pharmacy survey sought to determine the price of 14 prescription drugs commonly used by elders. This information was to be used as baseline data by which to measure physician knowledge of drug costs. The drugs were chosen after consultation with a physician specializing in pharmacological issues and geriatrics and a community pharmacist serving large numbers of elderly customers. Federal and state reports on utilization rates of various prescription drugs by elders were also consulted. The survey was designed to include three pairs of generic and brand name drugs within the list of 14 drugs to permit a subsequent comparison of the knowledge of physicians about the cost differences between the two types of drugs in each pair.

Twenty-two pharmacies in the greater Boston area, including both chain and independently owned pharmacies, formed the convenience sample for the pharmacy survey. Students in the Gerontology Program visited each pharmacy and obtained complete price data for the 14 drugs.

Physician survey

The physician survey was developed to gauge physician knowledge of the cost of the 14 selected prescription drugs as well as to ascertain whether concerns regarding the price of drugs affected the prescribing process. The questionnaire was pretested on several physicians and revised based on their responses. The final survey form contained 20 questions and took approximately 10 minutes to complete.

The survey was administered to a convenience sample of physicians at seven separate sites--six hospitals in eastern Massachusetts (five in the greater Boston area and one in Worcester) and one district medical society meeting. Survey forms were distributed at group meetings, either continuing education sessions or medical staff meetings. Prior to test-site visits, appropriate medical staff and meeting conveners were contacted to facilitate the participation of physicians. The forms were given to them at the start of the meetings and collected at the end. This survey implementation process was specifically selected to ensure that physicians filled out the forms themselves and relied entirely on their own knowledge in estimating prices. In all, 132 physicians responded to the questionnaire.

FINDINGS

Pharmacy Survey Results

The survey of the pharmacies revealed considerable variation in drug costs depending on the choice of pharmacy and the selection of generic vs. brand-name drugs. The pharmacy prices are summarized in Table 1 with four measures shown for each drug: the lowest price, the highest price, the mean price, and the standard deviation. Price ranges were dramatic for some drugs. For example, the low price reported for Tenormin (atenolol) was $46.17 whereas the high price was $81.95. Similarly, Zantac's low price was $66.19; the high price was $94.75.

The pharmacy survey contained three pairs of brand-name drugs and their generic equivalents. A comparison of the lowest cost reported for the generic drug with the highest price reported for the brand-name drug showed the extent of savings possible by a combination of checking individual pharmacy prices and selecting generic drugs. For example, the generic isosorbide could be purchased for as little as $3.99 whereas the brand-name Isordil had a high price of $25, resulting in a possible difference of $21 for a similarly effective drug. The difference in the mean prices for isosorbide and Isordil was $15.31, with isosorbide having a mean price of $5.43 and Isordil having a mean price of $20.74.

Similarly, cost differences can be found in comparing the prices of the other two brand-name drugs and their generic equivalents. The mean price for the brand-name drug

Table 1

DRUG PRICES

(n = 22 pharmacies)

DRUG	DOSE/AM'T	LOW	HIGH	MEAN	ST.DEV.
Ampicillin	250 mg/ 40	$6.19	$10.85	$7.33	$1.21
Cardizem	60 mg/100	44.00	62.50	52.19	4.54
Cipro	500 mg/ 30	71.00	84.65	76.44	3.82
Dyazide	/100	27.98	38.95	31.28	3.05
Furosemide	40 mg/100	6.99	12.86	8.48	1.27
Isordil	10 mg/100	17.00	25.09	20.74	1.98
Isosorbide	10 mg/100	3.99	8.49	5.43	1.29
Lasix	40 mg/100	11.99	21.79	16.98	2.78
Micro-K	10 mg/100	14.19	18.09	16.08	1.16
Naprosyn	500 mg/ 60	40.50	70.50	59.93	5.76
Potassium chloride elixir	1 pint	2.00	5.87	4.28	.93
Procardia	10 mg/100	36.49	56.95	44.90	5.21
Tenormin	50 mg/100	46.17	81.95	65.63	6.95
Zantac	150 mg/ 60	66.19	94.75	76.18	6.27

Lasix was $16.98 whereas the mean price for its generic equivalent furosemide was $8.48, or half that of the brand-name drug.

The third pair of drugs for which the cost was surveyed was Micro-K and potassium chloride elixir. The mean price for the brand-name Micro-K was $16.08, whereas the mean price for potassium chloride elixir was $4.28, about a quarter of the brand-name price.

Profile of Physicians and Their Practices

Of the 132 physicians who completed the questionnaire, most were private practitioners (50%) and "hospital-based" (45%), with some physicians falling into both of these categories. In addition, 12% were affiliated with an Independent Professional Association (IPA), 10% with a Health Maintenance Organization (HMO), and 8% with a Preferred Provider Organization (PPO). Only 7% of the respondents replied that they were affiliated with a community-based health center. While the areas of medical specialty of these physicians ranged widely, the largest group (45%) specialized in internal medicine, another 8% specializing in cardiology, and 7% in family practice. The physicians in the sample were similar to the profile of the Massachusetts Board of Registration in Medicine with respect to their specializations (Table 2). In no case were sample members as much as 10% different from registered physicians in the state. Specialists in internal medicine, family practice, and cardiology are slightly overrepresented in the sample. Surgeons and psychiatrists are slightly underrepresented. Most (88%) of the respondents indicated that they were board-certified in their area of specialty.

With regard to the age of the physicians, 35% of respondents were 40 to 49, and another 32% were 30 to 39. The next largest group (18%) were 60 to 69. Physicians were also asked about the age of their patient population. Approximately 76% indicated that at least a quarter of their patient population was over 65 years old, and 42% said at least half of their patient population was over 65.

Physicians' Awareness of Patients' Ability to Afford Drugs

Physicians indicated that they had a fairly high degree of awareness of whether or not patients' drug costs were covered by Medicaid or private insurers. Approximately 45%

Table 2

AREA OF PHYSICIAN SPECIALTY

(Percentages)

SPECIALTY	SAMPLE	MASSACHUSETTS[1]
Internal medicine	45.7	36.4
Family practice	7.0	3.6
Cardiology	8.5	3.5
Surgery	5.4	14.4
Psychiatry	5.4	11.4
Pathology	1.5	2.8
Other	26.6	27.9
Total percent	100.0	100.0
Number	129	16,674

[1] Source: Massachusetts Board of Registration in Medicine, Statistics on Current Physician Specialty, March 1990

said they were "frequently" aware of whether or not patients had coverage while another 37% said they were "sometimes" aware. The remaining 18% indicated that they were "never" or "rarely" aware of their patients' drug coverage. The majority (69%) of physicians responding stated that this knowledge would "sometimes" (46%) or "frequently" (23%) affect the drugs they would prescribe. The remaining respondents indicated that this knowledge would rarely (14%) or never (5%) affect their prescribing behavior.

According to the survey, patients showed a substantial level of interest in the cost of drugs. When asked whether patients ever inquired about the cost of a prescribed drug, about half of the doctors (51%) stated that patients "sometimes" asked and 13% indicated that patients "frequently" asked. Only 30% of respondents replied that patients "rarely" ask, and only 7% replied that patients "never" ask. The large majority of respondents (85%) noted that they had a patient indicate that he or she could not afford a drug that had been prescribed. Most physicians (81%) indicated that between one to five patients a month would discuss their inability to pay for drugs prescribed.

Physicians were asked open-ended questions as to how they respond to their patients' inability to afford prescribed drugs. In response, 73% of the respondents said they tried to find a cheaper alternative while 46% said they gave free samples. Other physicians responded that they tried to find financial assistance for the patient (6%), called the hospital insurance office (5%), or checked for Medicare/Medicaid eligibility (2%). The respondents were next presented with a series of statements outlining alternative actions that could be taken because of concerns about a patient's ability to pay for a drug and asked what they had done. The physicians most frequently indicated that they had "switched to an alternative drug that costs less" (84%), "provided free samples" (76%), "suggested that patients comparison shop to find the pharmacies with the lowest prices" (61%), or "distinguished between drugs that were 'necessary' and those that were 'helpful' "(59%). Another 52% said they had allowed "generic substitution when they ordinarily wouldn't," and 41% had "reduced the quantity of pills prescribed." The lowest number of respondents (38%) said they had "suggested particular pharmacies with low prices." In answer to a separate question, the large majority of respondents (80%) felt that there were situations in which it was appropriate to let a patient's ability to afford the drug influence drug selection for that patient.

Physicians' Prescription of Generic Drugs

When asked whether they ever write "no substitution" on prescriptions to prevent a generic drug from being used, the largest number of respondents (44%) indicated they "sometimes" did and another 12% indicated that they "frequently" did. Another 39% said they "rarely" write "no substitution," and only 5% indicated that they "never" write it. The drugs most frequently mentioned as the ones for which "no substitution" would be written were: Lanoxin (digoxin), Dilantin (phenytoin), Coumadin (warfarin), and Synthroid (levothyroxine), with from 20% to 13% of physicians naming one or more of these. Another 11% of respondents said that they would write "no substitution" when a patient so requested.

Physicians were given several options as to why they might prescribe a brand name as opposed to a generic drug. The majority of respondents (81%) checked that they would do so if they "received information that a generic drug is less effective than the brand name." Another 37% stated that would prescribe a brand name "if a patient has an adverse reaction to a generic." In addition, 32% said that if they had "several patients with adverse reactions to a generic, (they) would use the brand name for all patients requiring that type of drug." A fifth of the physicians queried indicated their overall negative reactions to generic drugs by stating that in general they didn't "feel that generic drugs are as safe or effective as brand name drugs."

Respondents were divided as to whether they initiated discussions with their patients on brand-name vs. generic drug use with 39% responding that they "sometimes" initiated discussions on this issue and another 39% responding that they "rarely" initiated such discussion. Twelve percent indicated that they "frequently" initiated discussions on generics vs. brand and 11% said they "never" did.

Decision-Making by Physicians in Prescribing Drugs

Respondents were asked several questions related to factors that might affect their decisions in prescribing drugs. When asked whether they "felt pressure from patients to prescribe a drug in situations where they didn't feel a prescription drug was necessary," 56% indicated that they "sometimes" felt this pressure, and an additional 5% said they felt such pressure "frequently." The remaining physicians said they "rarely" (32%) or "never" (8%) felt such pressure from patients. Physicians were also queried as to whether they receive information about cost as well as effectiveness and indications for the drugs they receive. Over one fourth (26%) indicated that they "frequently" receive drug cost information with another 44% indicating they "sometimes" receive this information. Another fourth (25%) indicated that they "rarely" receive cost information, and a mere 5% replied that they "never" receive the information. When further queried as to the source of their information on drug cost, the most frequent response was "detail men" or drug company representatives (37%); others were a pharmacy (34%),"The Medical Letter" (16%), patients (9%), and colleagues (5%).

Physicians were further asked how they kept abreast of current drugs on the market and of new research on drug impact. They were given a list of possible information sources. The most frequently checked were "medical periodicals and journals" (97%), "lectures and seminars" (94%), "continuing education classes" (76%), "drug manufacturers" (67%), and "government publications" (59%). Also, approximately 15% wrote on their forms in space provided that they received information on current drugs and research from "The Medical Letter." Another 6% noted that "colleagues" were a source of information.

Physician Knowledge of Drug Costs

A major component of the survey was to test physicians' knowledge of the costs of the 14 selected drugs commonly used by elders. Respondents were given the list of drugs and asked to estimate the cost for a specified quantity and dosage. If they had never prescribed the specified drugs, they were asked to check a box indicating so. Only 99 of the 132 physicians (75%) completing the survey questionnaire responded to the questions asking for drug cost estimates. The remaining 33 (25%) did not estimate a single drug price. There are several possible reasons for physicians not completing this part of the survey. Some may have been unaware of certain drug prices because the nature of their practices makes it unlikely that they ever prescribe those drugs. Also, many physicians, despite the anonymity of the questionnaire, may have felt embarrassed about their lack of knowledge of drug costs and, consequently, chose not to respond. Finally, given that this was the last question in the survey, some respondents may simply have balked at completing a more detailed final question.

Correlation and multiple regression techniques were used to determine if certain characteristics and behavior of the physicians were related to the absence of a response to the question on drug price estimates. The number of drug prices estimated was related to two background variables: specialty in internal medicine and age of the physician (Table 3). Physicians specializing in internal medicine and younger physicians were more likely to make larger numbers of estimates. The number of drug prices estimated was also positively associated with the frequency that physicians reported that they were aware of whether patients had drug costs covered by Medicaid or private insurance and with their involvement in helping patients cope with drug costs. The physicians who gave more estimates on drug prices were also more likely to report actions to help patients with drug prices than other physicians. All four of the associations were strong; in each case chance can be ruled out as an explanation.

The estimates of drug prices by these physicians were compared with the actual drug prices to determine the direction of the differences. In general, physicians overestimated the prices of the less expensive drugs and underestimated the prices of more expensive drugs (Figure 1 and Table 4). The prices of five of the 14 drugs were underestimated and the remaining nine were overestimated. Four of the five underestimated were the four highest-priced drugs. Physicians, then, tended to more closely cluster the prices of different drugs and to minimize the real price differences. Their estimates on each drug were, however, much more variable than actual prices. For example, the mean price of the drug Dyazide was $31.28. Half of the prices were between $27.99 and $33.45 (Figure 2). The mean estimate made by physicians was $27.49 with the middle half of the estimates by physicians between $12 and $40. The same pattern appeared in the case of the more expensive drugs. In the case of Zantac, for example, the middle half of the prices fell between $72.67 and $79.49 (Figure 2). The middle half of the estimates by physicians fell between $35 and $62.50. The pattern prevailed also for less expensive drugs. In the case of potassium chloride elixir, for example, half of the prices were actually between $3.99 and $4.99; half of the estimates were between $5 and $10 (Figure 2).

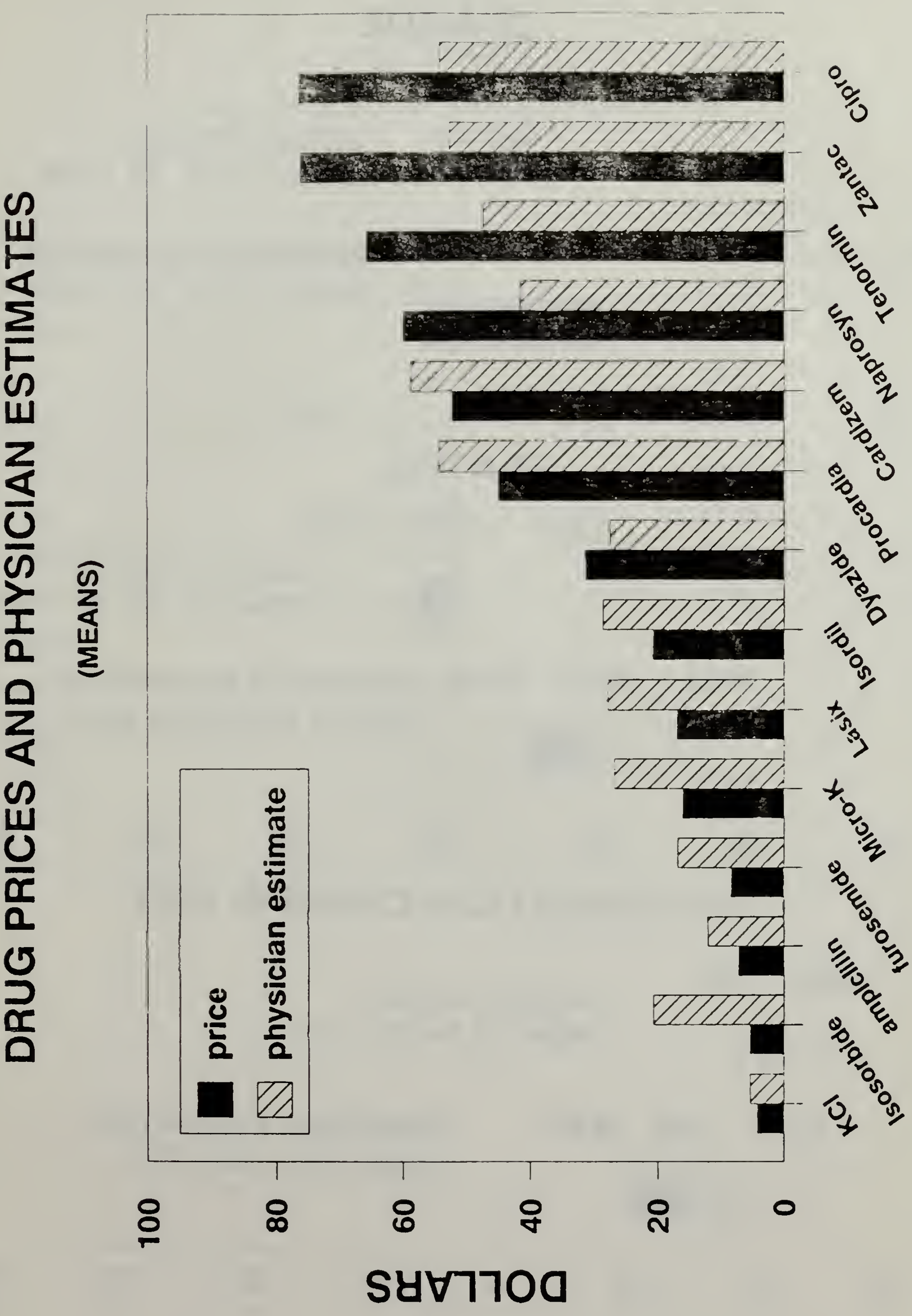
Table 3

NUMBER OF DRUG PRICES ESTIMATED
(n = 132)

VARIABLE	CORRELATION COEFFICIENT	MULTIPLE REGRESSION Adjusted R^2=.34	
		COEFFICIENT	SIGNIF.
Internal medicine	.40 ***	3.14	***
Age of physician	-.31 ***	-1.02	**
Percent of patients over 65	-.03 ns		
Physician awareness of drug cost coverage	.28 ***	1.08	
Frequency of patient drug price inquiries	.13 ns		
OK for affordability to affect drug selection	-.15 ns		
Frequency of physician initiated brand name-generic discussion	.09 ns		
Number of reasons checked for brand name preference	.14 ns		
Activity to help patients cope with drug costs	.46 ***	1.21	***

ns = not significant
* $p < .05$
** $p < .01$
*** $p < .001$

Figure 1



DRUG PRICES AND PHYSICIAN ESTIMATES

(MEANS)

Figure 2

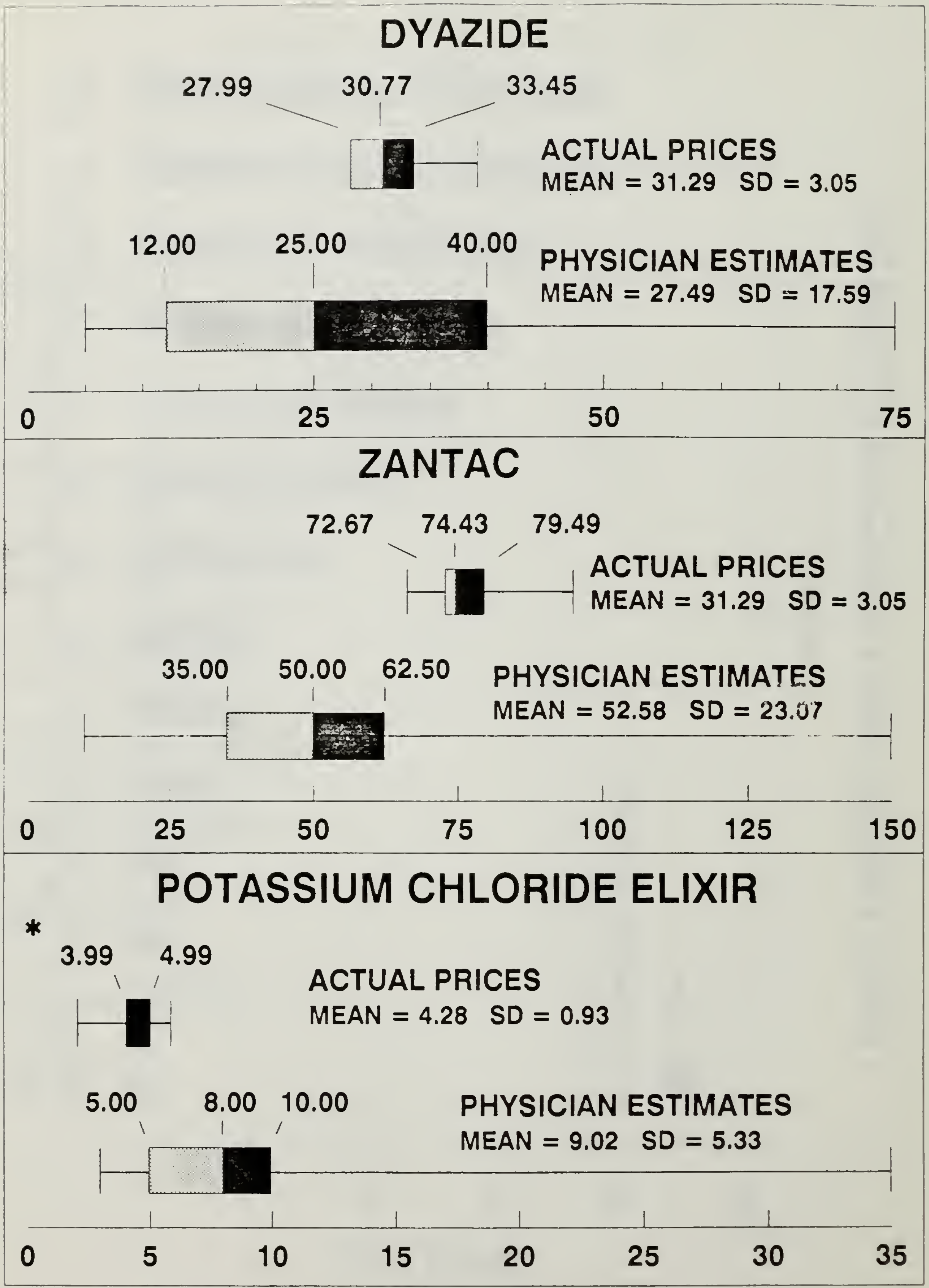

DYAZIDE
27.99
30.77
33.45
ACTUAL PRICES
MEAN = 31.29 SD = 3.05
12.00
25.00
40.00
PHYSICIAN ESTIMATES
MEAN = 27.49 SD = 17.59
0
25
50
75
ZANTAC
72.67
74.43
79.49
ACTUAL PRICES
MEAN = 31.29 SD = 3.05
35.00
50.00
62.50
PHYSICIAN ESTIMATES
MEAN = 52.58 SD = 23.07
0
25
50
75
100
125
150
POTASSIUM CHLORIDE ELIXIR
*
3.99
4.99
ACTUAL PRICES
MEAN = 4.28 SD = 0.93
5.00
8.00
10.00
PHYSICIAN ESTIMATES
MEAN = 9.02 SD = 5.33
0
5
10
15
20
25
30
35

Table 4

DRUG PRICES AND PHYSICIAN ESTIMATES
(Means)

DRUG	PRICE	PHYSICIAN ESTIMATE
Ampicillin	$7.33	$12.12
Cardizem	52.19	58.62
Cipro	76.44	54.15
Dyazide	31.28	27.49
Furosemide	8.48	16.86
Isordil	20.74	28.61
Isosorbide	5.43	20.67
Lasix	16.98	27.81
Micro-K	16.08	26.78
Naprosyn	59.93	41.45
Potassium chloride elixir	4.28	5.33
Procardia	44.90	54.28
Tenormin	65.63	47.25
Zantac	76.18	52.58

The responses from physicians indicated a generally very imprecise knowledge of drug prices. Their estimates were rated as correct for the purpose of this study by two sets of criteria. By the more stringent criterion (A), they were rated as correct when they were between 75% and 125% of the mean price as determined through the pharmacy survey. In the less stringent approach (B), they were rated as correct when they were between 50% and 150% of the mean price. In the case of Isordil, for example, which had a mean price of $20.74, estimates were rated as correct under criterion (A) when they were between $15.18 and $25.92. By criterion (B), the estimates were "correct" when between $10.37 and $31.11.

By both criteria, physician estimates were frequently incorrect (Table 5). By criterion A, 82% of the physicians were correct in their estimates less than half of the time. Only 2% were correct on more than 70% of their estimates. By criterion (B), 70% were correct with fewer than 70% of their estimates.

Three pairs of brand-name drugs and their generic equivalents were included in the list of 14 drugs to be estimated. The physician estimates in price for each pair were compared and categorized as follows: correct; overestimated the difference; underestimated the difference; no difference; and reverse direction. Differences were considered correct if the estimated difference was between 50% and 150% of the actual difference. For the first combination of Micro-K (brand-name) and potassium chloride elixir (generic), 36% of the respondents were categorized as correct in their estimates of the cost differences between these two drugs. Another 40% overestimated the difference in price and 13% under-estimated the difference. However, 5% of the physicians responding estimated no difference between the costs, and an additional 5% estimated the generic as more costly than the brand-name drug and were categorized as reverse (Table 6).

The second pair of drugs was Lasix (brand-name) and furosemide (generic). The cost difference for this combination was estimated correctly by 43% of the respondents. Another 38% overestimated the difference in cost between the two drugs, and 8% underestimated the difference. An additional 8% estimated no difference between the two, and 3% of physicians estimated that the generic drug was more expensive than the brand-name.

Table 5

PERCENT CORRECT[1]

(n=99)

PERCENT CORRECT	CRITERION A[2]		CRITERION B[3]	
	%	CUM %	%	CUM %
0	13.1	13.1	4.0	4.0
1-10	4.1	17.2	------	4.0
10-20	5.1	24.2	------	4.0
20-30	27.3	51.5	5.1	9.1
30-40	21.2	72.7	11.1	20.2
40-50	8.1	81.8	6.1	26.3
50-60	10.1	91.9	28.3	54.6
60-70	6.1	98.0	15.1	69.7
70-80	------	99.0	17.2	86.9
80-90	1.0	100.0	4.0	90.9
90-100	------	------	1.0	91.9
100	1.0	100.0	8.1	100.0

[1] Respondents estimating one or more drug price only.

[2] Criterion A: judged correct if estimate falls within plus or minus 25% of mean price.

[3] Criterion B: judged correct if estimate falls within plus or minus 50% of mean price.

Table 6

ACCURACY OF ESTIMATED DIFFERENCES BETWEEN BRAND NAME AND GENERIC DRUGS

(Percentages)

OUTCOME	MICRO-K & POT.CHL.ELX	LASIX & FUROSEMIDE	ISORDIL & ISOSORBIDE
Reverse direction	5.4	2.7	10.5
No difference	5.4	8.1	25.4
Under-estimate	12.7	8.1	14.9
Correct	36.5	43.2	38.8
Over-estimate	40.0	37.9	10.4
Total Percent	100.0	100.0	100.0
Number	55	74	51

The final drug pair consisted of Isordil (brand-name) and isosorbide (generic). In estimating the price difference for this pair, 39% of respondents were correct, 10% overestimated the cost difference, and 15% underestimated the difference. However, one fourth of the physicians estimated no price difference between these two drugs, and another 10% estimated the cost of the generic as higher than the brand-name cost.

Only a small proportion of the physicians were consistently accurate in estimating differences between brand name and generic drugs. Of the 51 physicians who estimated all three combinations, only 6% were correct for all three pairs and another 29% were correct on two of the pairs (Table 7).

What explains the variation among physicians in their knowledge of drug prices? A number of potential explanatory variables were examined. (The analysis was based on criterion (A) and percentage of correct estimates.) Included in the analysis was a constructed variable, physician activity to cope with drug prices. This variable was based on two questions: an open-ended question in which physicians were asked what they do when patients say they cannot afford a drug and a second question that asked respondents to check strategies they have used because of concerns about a patient's ability to pay for a drug. The measure "physician activity" is based on the number of activities checked and written in. Through a bivariate analysis, none of the background variables was found to be significantly associated with knowledge of drug prices. However, multiple regression findings indicate that two background variables, age and medical specialty predict physician accuracy in estimating drug prices (Table 8). Younger physicians were more likely than older physicians to make correct estimates; specialists in internal medicine were less likely to make correct estimates than physicians in other specialties.

Of greater importance is the fact that accuracy of price estimates was positively correlated with activity to help patients cope with drug costs. In other words, the physicians who were more accurate in estimating drug prices reported that they took more actions to help patients cope with drug costs.

Table 7

ACCURACY IN ESTIMATING BRAND NAME-GENERIC DIFFERENCES[1]

NUMBER OF ACCURATE ESTIMATES OF DIFF'S.	FREQUENCY	PERCENT	CUM. PERCENT
0	11	21.6	21.6
1	22	43.1	64.7
2	15	29.4	94.1
3	3	5.9	100.0
Total	51	100.0	

[1] Respondents estimating all three pairs only.

Table 8

PERCENTAGE OF ACCURATE ESTIMATES[1]
(n=98)

VARIABLE	CORRELATION COEFFICIENT	MULTIPLE REGRESSION COEFFEC.	SIGNIF.
			adj.R^2=.16
Internal medicine	-.10 ns	-9.07	*
Age of physician	-.17 ns	-4.22	*
Physician awareness of drug cost coverage	.18 ns	2.76	ns
Frequency of patient drug price inquiries	.17 ns	1.79	ns
Activity to help patients cope with drug costs	.33 ***	1.31	**

ns = not significant
* $p < .05$
** $p < .01$
*** $p < .001$

[1] Judged correct if estimate fell 75% and 125% of mean price.

The variables found to be significantly associated with sensitivity to drug prices were included in a multiple regression analysis. The model accounts for 18% of the variance in percent of drug prices underestimated. Three of the five explanatory variables emerged from the multiple regression analysis as statistically significant predictors of sensitivity to drug prices: the age of the physician, his or her awareness of drug cost coverage, and reported activity to help patients cope with drug costs.

Because of its behavioral importance, the activity of physicians in helping cope with drug costs was examined as an outcome variable. Several variables were significantly correlated with such activity (Table 9). Specialization in internal medicine, reported awareness of drug cost coverage, frequency of patient inquiries about drug costs, and physician initiation of discussion about drug prices were all positively and significantly associated with physician activity to help patients cope with drug costs. As reported previously, accuracy in estimating drug prices was positively associated with physician activity to help patients cope with drug costs.

A multiple regression analysis showed that only the reported frequency of patient inquiries about drug costs and the percentage of correct drug price estimates were associated with activity by physicians in helping patients cope with drug costs (Table 9). The model explained 25% of the variance in the dependent variable. The results suggest that inquiries from patients themselves about drug costs may be an important independent factor in stimulating physician actions to help patients cope with drug costs.

Table 9

PHYSICIAN ACTIVITY TO HELP PATIENTS COPE WITH DRUG COSTS
(n=99)

VARIABLE	CORRELATION COEFFICIENT		MULTIPLE REGRESSION Coeffic.	Signif.
			Adj.R^2=.25	
Internal Medicine	.18	**	.19	ns
Physician age	-.06	ns		
Percent patients over 65	-.15	ns		
Physician awareness of drug cost coverage	.27	**	.22	ns
Patient inquiries about drug costs	.40	***	.21	***
OK for affordability to affect prescription practices	-.07	ns		
Frequency of physician initiated brand name-generic discussion	.30	***	.19	ns
Percent correct estimates[1]	.33	**	.02	**
Percent accurate estimates of brand name-generic price differences	.07	ns		

ns = not significant
* p < .05
** p < .01
*** p < .001

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[1] Judged correct if estimate fell between 75 and 125 of mean price.

SUMMARY OF MAJOR FINDINGS

1. Physicians had a low level of knowledge of drug costs.
    - Only 14% had a score of 50% or more correct estimates.
    - Physicians overestimated the prices of the less expensive drugs and underestimated the costs of the more expensive drugs.
    - Younger doctors were more likely than older doctors to correctly estimate the price of the drugs.
    - When faced with three pairs of brand-name drugs and their generic equivalents, at least 10% of physicians either saw no difference in the prices or thought the generic was more expensive. For one of these drug pairs, more than one third of the physicians either thought there was no price difference or reversed the direction of the difference in cost.
2. Many physicians do not receive information about drug costs.
    - Thirty percent of respondents indicated they "rarely" or "never" receive drug cost information.
3. Drug company salespeople ("detail men") were the most commonly cited source of information on drug costs; 37% of respondents indicated this as their chief source of information about drug prices.
4. Many physicians still remain skeptical about generic drugs and do not discuss generic alternatives with their patients.
    - One fifth of physicians indicated that in general they do not believe that generic drugs are as safe or effective as brand-name drugs.
    - Twelve percent of respondents said that they frequently write "no substitution" when prescribing and 14% reported that they sometimes will not allow substitution.
    - Half of physicians rarely or never initiate discussions with patients on the use of generic drugs.
5. Physicians indicated that they consider the cost of a drug and a patient's ability to pay when prescribing.

- -- Eighty percent said there were situations in which it was appropriate to let a patient's ability to afford a drug influence the drug selection.
- -- Sixty-nine percent said knowing whether patients' drug costs were covered by third-party payers affects the drugs they prescribe.

6. Physicians say they respond to a patient's inability to pay for a drug by switching to a cheaper alternative. In response to two separate questions, 73% and 84% of respondents indicated that they would prescribe a less expensive drug if a patient indicated the inability to purchase the first one prescribed.
7. Physicians indicate there is some interest in price and some concern about the ability to afford drugs among patients.
    - -- Sixty-four percent of physicians said patients frequently or sometimes ask about the cost of a drug.
    - -- Eighty-five percent of physicians say they have some patients who express the fact that they cannot afford prescribed drugs.

ANALYSIS AND DISCUSSION

Findings from this study confirm those from a 1970 California study of 220 physicians, which also found that physicians had limited knowledge of the cost of drugs.[23] Yet, despite this lack of knowledge, many physicians indicated that they frequently make decisions about which drugs to prescribe based on cost, and admit that cost can be an important factor particularly when prescribing for patients who do not have coverage by third-party payers.

In response to a question asking for general comments on the issue of drug costs, several physicians noted their frustration about lack of information in this area. One physician wrote: "No one ever talks about this! The pharmacy at our hospital should two times a year send out a list of common meds and costs." Another physician commented, "The fact that I have trouble filling [in] the estimated prices reflects traditional teaching . . and the fact that prices are not itemized or listed during a 'pure medical educational' lecture nor are prices traditionally thought to be a primary factor in prescribing; however, in primary care, I have discovered that price can be the important aspect."

That physicians report some patients ask about drug cost shows that patients are concerned about prices and also that patients may presume their physicians are knowledgeable in this area. In another study concerned with patients' perceptions of the prescribing practices of physicians, few patients reported that their physicians discussed the cost of alternative drugs or alternative nondrug therapy. Also, one sixth reported that they felt a more expensive drug than necessary was prescribed. [24]

If physicians are considering prices when prescribing drugs, accurate knowledge of the prices, of course, would be crucial to the prescribing process. However, medical education does not cover this issue, and professional articles and journals rarely include information about the costs of drugs. The major source of drug cost information is from drug companies through their "detail men." Such information is, therefore, limited to drugs which pharmaceutical companies are actively trying to sell. Physicians also appear to need more information on the safety and efficacy of generic drugs to respond to their continued concerns and misgivings about them and to promote cost-effective prescribing.

Although this was a pilot study using a convenience sample of pharmacies and physicians, it indicates an interest on the part of physicians in the price of the drugs they prescribe and offers the possibility that education of physicians may be an approach to controlling drug expenditures for patients.

One approach to education, called "academic detailing" involves visits to physicians by clinical pharmacists. In a 1982 study, clinical pharmacists worked as "education outreach workers" with the goal of re-educating physicians regarding cost and efficacy of commonly used drugs.[25] The re-education was implemented with a positive as opposed to punitive approach and utilized traditional concepts of effective adult education. Research on this program found that physicians generally welcomed this objective educational intervention and that "in-person education" can improve practice without the use of economic incentives.[26] However, at present there is no incentive to provide objective education for physicians on the price and efficacy of drugs.

With a few exceptions, neither providers, nor insurance companies, nor medical schools have initiated price education programs for physicians. Some health maintenance organizations, such as the Harvard Community Health Plan, provide seminars for their staff physicians on drug efficacy and prices. Massachusetts Blue Cross/Blue Shield has recently contracted for an educational and outreach program to update Massachusetts physicians on drug efficacy, side effects, and costs. However, in general, there is little activity directed at educating physicians as a means of reducing expenditures on prescription drugs.

CONCLUSION

Through control of the prescribing process, physicians' actions directly impact the costs that elders pay for drugs. This study has documented the need for further education for physicians on cost-effective prescribing. It has also raised numerous questions and issues requiring further research.

Physicians receive minimal training and information on pharmacology and almost none on drug costs. The major source of information for them on drugs and drug cost is from drug "detail men," which starts early in a physician's career. Physicians can certainly not be expected to research drugs and drug prices on their own. Universities, physicians' professional associations, hospitals, and insurance companies need to address the best methods for providing valuable and updated information on drugs and drug cost to physicians. The work on "academic detailing" is a start in this direction and should be reviewed carefully for replication. Other methods for providing this information need to be studied to determine which combination is the most effective and feasible. Possible options include periodic distribution by either hospitals or consumer health groups of lists of commonly used drugs and their cost. Drug cost information could also be included in medical journal articles on drugs and in medical advertising for drugs. .

This study's findings indicate that, despite voluminous data supporting the efficacy of generic drugs, many physicians still remain skeptical about generic drugs and do not discuss generic drugs with their patients. There may be a need for further education and research on this issue by physicians for them to develop a consensus on the safety and efficacy of generics.

Educational interventions represent a positive approach to modifying the behavior of physicians in prescribing drugs. Other approaches that may be considered include restricted drug formularies and the use of prescription formats that facilitate generic prescribing.

Elders, and other patients also, should be educated not to presume that physicians always follow cost-effective prescribing. Patients need to be taught to be assertive, to ask questions, and to check with their local pharmacists. The findings of this study also suggest that by taking the initiative in asking physicians about the cost of prescription drugs, patients can help themselves by stimulating physicians to take steps that will help in coping with drug costs.

This study shows a widespread ignorance on the part of the physician concerning the cost of drugs and yet a high level of agreement among physicians that the affordability of a drug should be considered in the prescribing decision. The findings imply that education of physicians may be a method that could reduce expenditures on prescription drugs. As drug costs become a source of increasing concern, efforts to control costs should focus more attention on those who are prescribing them.

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THE GERONTOLOGY INSTITUTE

The University of Massachusetts at Boston

Established in 1984, the Gerontology Institute at the University of Massachusetts at Boston furthers the University's commitment to the study and development of social policy on aging. The Institute conducts policy research on issues affecting older people and their families. In addition, the Institute assists national, state, and local organizations analyze policy issues and formulate policy options on matters concerning the elderly. Core funding is provided by the Massachusetts Legislature. Major projects are funded through grants and contracts.

Programs of the Institute are carried out through two divisions: The Frank J. Manning Research Division and the Public Policy Division. A major research priority is productive aging, that is, opportunities for older people to play useful social roles. A second priority is long-term care for the elderly. Additional major concerns of the Public Policy Division include health care policy, income security policy, and housing, with particular attention to the special needs of racial and ethnic minority elderly.

In the fall of 1990, the University introduced a Ph.D. program in Gerontology with an emphasis in social policy. It is one of two such programs in the country. The Institute is a teaching resource for the Ph.D. program. In addition, the Institute provides doctoral students with experience in research and policy analysis.

The Institute also supports the University's Gerontology Certificate program. A one-year program of concentrated study, the Gerontology Certificate program prepares older learners for roles in aging services. Most students are over 60 years of age. Through an Advanced Certificate program, selected graduates participate in applied research projects within the Institute. The regular involvement of older people helps to assure that Institute projects reflect the concerns of older people.

Another activity of the Institute is the publication of a scholarly quarterly with an international perspective, the Journal of Aging & Social Policy. The journal is issued by Haworth Press.

Since its formation, the Institute has been directed by Scott A. Bass, Ph.D. It has a permanent faculty and staff of approximately 16 people and is located in the heart of Boston in the University's Downtown Center.